

Notice No.2

Rules and Regulations for the Classification of Naval Ships, January 2016

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Please note that paragraphs, Tables and Figures are not shown in their entirety. This Corrigenda Notice shows amendments only.

Issue date: November 2016

Amendments to	Effective date
Volume 1, Part 3, Chapter 4, Section 7	Corrigendum
Volume 1, Part 6, Chapter 2, Section 2	Corrigendum
Volume 1, Part 7, Chapter 2, Section 4	Corrigendum
Volume 2, Part 2, Chapter 1, Section 1	Corrigendum
Volume 2, Part 2, Chapter 3, Section 4	Corrigendum
Volume 2, Part 7, Chapter 1, Sections 5 & 11	Corrigenda
Volume 2, Part 7, Chapter 2, Sections 2 & 10	Corrigenda
Volume 2, Part 7, Chapter 5, Section 2	Corrigendum
Volume 2, Part 9, Chapter 2, Section 5	Corrigenda
Volume 2, Part 11, Chapter 1, Sections 2 & 3	Corrigenda
Volume 2, Part 11, Chapter 3, Section 2	Corrigenda
Volume 3, Part 2, Chapter 2, Section 2	Corrigenda

Volume 1, Part 3, Chapter 4 Closing Arrangements and Outfit

- **Section 7**
Air pipes **Air and sounding pipes**

Volume 1, Part 6, Chapter 2 Design Tools

- **Section 2**
Structural design

2.9 Proportions of stiffener sections

2.9.2 ~~Primary members of asymmetrical section are to be supported by tripping brackets at alternate secondary members. If the section is symmetrical, the tripping brackets may be four spaces apart.~~ Primary members are to be supported by tripping brackets. The tripping brackets supporting asymmetrical sections are to be spaced no more than two secondary frames apart. The tripping brackets supporting symmetrical sections are to be spaced no more than four secondary frames apart.

Volume 1, Part 7, Chapter 2 Total Design Loads

- **Section 4**
Design load systems for longitudinally effective compounds

4.6 Bottom longitudinal girders (BG)

4.6.6 The design shear force for the bottom girder web plating is to include local and global components.

(b) The local shear force component, QV_{BG} , is due to the difference between the buoyancy and the inertial forces. It acts in the vertical direction and is to be taken as:

$$QV_{BG} = \frac{\epsilon_{BG} (B_{bg} S_{bg} (P_{CD} - P_{BS}) + [F_{CD}] + L_A)}{2}$$
$$QV_{BG} = \frac{\epsilon_{BG} (B_{bg} S_{bg} (P_{CD} - P_{BS}) + [F_{CD}] + L_A)}{2}$$

where

B_{bg} = mean spacing of longitudinal girders or other primary longitudinal structure, in metres, see Note 2.

Volume 2, Part 2, Chapter 1 Reciprocating Internal Combustion Engines

- **Section 1**
General requirements

1.5 Turning gear

1.5.4 The turning gear for all engines is to be fitted with safety Interlocks which prevent engine operation when engaged see ~~Vol 2, Pt 1, Ch 3, 4.13 Electromagnetic compatibility (EMC)~~ Vol 2, Pt 1, Ch 3, 4.14 Machinery Interlocks. Indication of engaged/disengaged is to be provided at all start positions. In the case of unattached hand operated turning gear engine operation may be prevented by manual means including the provision of warning devices or notices.

Volume 2, Part 2, Chapter 3 Steam Turbines

■ Section 4 Design and construction

4.8 Turning gear

4.8.3 The turning gear for all turbines is to be fitted with safety interlocks which prevent steam valve actuation for turbine operation when engaged, see *Vol 2, Pt 1, Ch 3, 4.13 Electromagnetic compatibility (EMC)* *Vol 2, Pt 1, Ch 3, 4.14 Machinery Interlocks*. Indication of engaged/disengaged is to be provided at all start positions. In the case of hand operated turning gear turbine operation may be prevented by manual means including the provision of warning devices or notices.

Volume 2, Part 7, Chapter 1 Piping Design Requirements

■ Section 5 Pipe connections joints

■ Section 11 Pipe connections Plastic pipes

11.1 General

11.1.1 Proposals to use ~~plastics~~ plastic pipes in shipboard piping systems will be considered in relation to the properties of the materials, the operating conditions, the intended service and location. Details are to be submitted for approval. Special consideration will be given to any proposed service for ~~plastics~~ plastic pipes not mentioned in these Rules.

11.1.3 ~~Plastics~~ Plastic pipes and fittings will, in general, be accepted in Class III piping systems. Proposals for the use of plastics in Class I and Class II piping systems will be specially considered.

11.1.6 The use of ~~plastics~~ plastic piping and components for magazine piping systems or for piping systems that may pass through magazine spaces is not permitted.

11.1.7 The use of ~~plastics~~ plastic pipes may be restricted, as specified by the Naval Administration.

11.1.8 Where there is a restriction on the use of ~~plastics~~ plastic materials for piping systems and associated equipment installed in naval ships, the Naval Administration may allow their use following a Risk Assessment, in accordance with *Vol 2, Pt 1, Ch 3, 17 Risk Assessment (RA)* that addresses the following:

- the potential fire risks in the space containing the ~~plastics~~ plastic materials;
- The effect of a fire in the compartment containing ~~plastics~~ plastic materials in terms of fire spread and of producing excessive quantities of smoke and toxic products.
- An engineering justification for the use of ~~plastics~~ plastic materials in preference to metallic materials which are not sensitive to heat.

11.2 Design and performance criteria

11.2.4 ~~Plastics~~ Plastic piping, connections and fittings to be electrically conductive when:

11.3 Design strength

11.3.5 High temperature limits and pressure reductions relative to nominal pressures are to be according to a recognised standard, but in each case the maximum working temperature is to be at least 20°C lower than the minimum temperature of deflection under load of the resin or ~~plastics~~ plastic material without reinforcement. The minimum heat distortion temperature is not to be less than 80°C. See also *Ch 14, 4 ~~Plastics~~ Plastic pipes and fittings* of the Rules for Materials.

11.3.6 Where it is proposed to use ~~plastics~~ plastic piping in low temperature services, design strength testing is to be made at a temperature 10°C lower than the minimum working temperature.

11.3.8 The selection of ~~plastics~~ plastic materials for piping is to take account of other factors such as impact resistance, ageing, fatigue, erosion resistance, fluid absorption and material compatibility such that the design strength of the piping is not reduced below that required by these Rules.

11.4 Fire performance criteria

11.4.1 Where ~~plastics~~ plastic pipes are used in systems essential to the safe operation of the ship, or for containing combustible liquids or sea-water where leakage or failure could result in fire or in the flooding of watertight compartments, the pipes and fittings, including couplings with flexible internal seals, are to be of a type which has been fire endurance tested in accordance with the requirements of *Table 1.11.3 Fire endurance requirements*.

11.4.2 The materials used for ~~plastics~~ plastic pipes, except those fitted on open decks and within tanks, cofferdams, void spaces, pipe tunnels and ducts are to have low flame spread characteristics.

11.4.3 The materials used for ~~plastics~~ plastic pipes within accommodation, service and control spaces are not to be capable of producing excessive quantities of smoke and toxic products that may be a hazard to personnel within those spaces.

11.6 Manufacture and quality control

11.6.1 All materials for plastics pipes and fittings are to be approved by LR, and are in general to be tested in accordance with *Ch 14, 4 ~~Plastics~~ Plastic pipes and fittings* of the Rules for Materials. For pipes and fittings not employing hand lay up techniques, the hydrostatic pressure test required by *Ch 14, 4.9 Hydraulic test* of the Rules for Materials may be replaced by testing carried out in accordance with the requirements stipulated in a National or International Standard, consistent with the intended use for which the pipe or fittings are manufactured, provided there is an effective quality system in place complying with the requirements of *Ch 14, 4.4 Quality assurance* of the Rules for Materials and the testing is completed to the satisfaction of the LR Surveyor.

11.6.3 ~~Plastics~~ Plastic pipes and fittings are to be manufactured at a works approved by LR in accordance with agreed quality control procedures which shall be capable of detecting at any stage (e.g. incoming material, production, finished article, etc.) deviations in the material, product or process.

11.6.4 ~~Plastics~~ Plastic pipes are to be manufactured and tested in accordance with *Ch 14, 4 ~~Plastics~~ Plastic pipes and fittings* of the Rules for Materials. For Class III piping systems the pipe manufacturer's test certificate may be accepted in lieu of an LR Certificate and is to be provided for each consignment of pipe.

11.7 Installation and construction

11.7.7 The required fire endurance level of the pipe is to be maintained in way of pipe supports, joints and fittings, including those between ~~plastics~~ plastic and metallic pipes.

Volume 2, Part 7, Chapter 2 Ship Piping System

■ Section 2 Construction and installation

2.1 Materials

2.1.3 Materials sensitive to heat, such as aluminium or plastics, are not to be used in systems essential to the safe operation of the ship, or for containing combustible liquids or sea-water where leakage or failure could result in fire or in the flooding of watertight compartments. See *Vol 2, Pt 7, Ch 1 Piping Design Requirements* for ~~plastics~~ plastic pipes.

■ Section 10 Air, overflow and sounding pipes

10.1 Materials

10.1.1 Air, overflow and sounding pipes are to be made of steel or other approved material. For use of ~~plastics~~ plastic pipes of approved type, see *Vol 2, Pt 7, Ch 1 Piping Design Requirements*.

Volume 2, Part 7, Chapter 5

Ship Type Piping Systems

■ Section 2

Construction and installation

2.1 Materials

2.1.3 Materials sensitive to heat, such as aluminium or plastics, are in general not to be used for Ship Type piping systems. Such materials are not in any event to be used in systems containing flammable liquids or sea-water where leakage or failure could result in fire or in the flooding of watertight compartments. See *Vol 2, Pt 7, Ch 1 Piping Design Requirements for ~~plastics~~ plastic pipes*.

Volume 2, Part 9, Chapter 2

Electrical Power Generator and Energy Storage

■ Section 5

Emergency and alternative sources of electrical power

5.2 Emergency source of electrical power

5.2.9 The transitional source of emergency electrical power where required by *Vol 2, Pt 9, Ch 2, 5.2 Emergency source of electrical power 5.2.8* is to consist of an accumulator battery suitably located for use in an emergency which is to operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12 per cent above or below its nominal voltage and be of sufficient capacity and is to be so arranged as to supply automatically in the event of failure of either the main or the emergency source of electrical power at least the following services if they depend upon an electrical source for their operation:

- (a) the lighting required by *Vol 2, Pt 9, Ch 2, 5.2 Emergency source of electrical power 5.2.7(a)*, *Vol 2, Pt 9, Ch 2, 5.2 Emergency source of electrical power 5.2.7(b)* and *Vol 2, Pt 9, Ch 2, 5.2 Emergency source of electrical power 5.2.7(c)*. For this transitional phase, the required emergency electric lighting, in respect of the machinery space and accommodation and service spaces may be provided by permanently fixed, individual, automatically charged, relay operated accumulator lamps; and
- (b) all services required by *Vol 2, Pt 9, Ch 2, 5.2 Emergency source of electrical power 5.2.7(d)(i)*, *Vol 2, Pt 9, Ch 2, 5.2 Emergency source of electrical power 5.2.7(d)(iii)* and *Vol 2, Pt 9, Ch 2, 5.2 Emergency source of electrical power 5.2.7(d)(iv)* unless such services have an independent supply for the period specified from an accumulator battery suitably located for use in an emergency.
- (c) Power to operate the watertight doors at least three times, i.e. closed-open-closed against an adverse list of 15°, but not necessarily all of them simultaneously, together with their control, indication and alarm circuits as required by *Vol 2, Pt 9, Ch 2, 5.2 Emergency source of electrical power 5.2.7(g)(i)*.

Volume 2, Part 11, Chapter 1

Made and Fresh Water Systems

■ Section 2

System construction and installation

2.7 ~~Plastics~~ Plastic piping and flexible hoses

2.7.1 Subject to compliance with *Vol 2, Pt 7, Ch 1, 11 Pipe connections* and *Vol 2, Pt 7, Ch 1, 13 Flexible hoses*, and the relevant Sections of *Vol 2, Pt 7, Ch 2 Ship Piping System*, ~~plastics~~ plastic piping which is internally uncoated may be used in piping systems for made and fresh water.

2.7.2 Any internally uncoated ~~plastics~~ plastic piping or flexible hose in contact with made or fresh water is to be suitable for the containment and transfer of made and fresh water.

2.7.3 Uncoated ~~plastics~~ plastic piping and flexible hoses are to be tested and certified as complying with current standards for use in made and fresh water systems.

2.7.4 ~~Plastics~~ Plastic piping is to be selected in consultation with the manufacturers with regard to suitability with the proposed pipe system cleaning practice.

■ Section 3 System arrangements

3.1 Water storage facilities

3.1.7 Air, filling and sounding arrangements for fresh water storage tanks are to be located and arranged to prevent an ingress of a contaminant. The arrangements for filling are to include a deck connection to facilitate external loading.

Volume 2, Part 11, Chapter 3 Waste Systems

■ Section 2 Construction and installation

2.6 ~~Plastics~~ Plastic piping and flexible hoses

2.6.1 Subject to compliance with *Vol 2, Pt 7, Ch 1, 11 Pipe connections* and *Vol 2, Pt 7, Ch 1, 13 Flexible hoses*, and the relevant Sections of *Vol 2, Pt 7, Ch 2 Ship Piping System*, ~~plastics~~ plastic piping may be used in piping systems for waste matter. Where storage tanks and metallic piping are constructed from materials that will not be affected by corrosion from waste matter, internal lining will not be insisted upon.

2.6.2 ~~Plastics~~ Plastic piping is to be selected in consultation with the manufacturers with regard to suitability with the proposed pipe system cleaning practice. Where storage tanks and metallic piping are constructed from materials that will not be affected by corrosion from waste matter, internal lining will not be insisted upon.

Volume 3, Part 2, Chapter 2 Environmental Protection

■ Section 2 ENV characters

2.3 Grey water and sewage – GW character

2.3.1 For assignment of the **GW** character where a plant for the treatment of grey water is installed, the plant discharge effluent is to meet the standards specified in ~~*Vol 3, Pt 2, Ch 2, 2.3 Grey water and sewage – GW character 2.3.2*~~ *Vol 3, Pt 2, Ch 2, 2.3 Grey water and sewage – GW character 2.3.3* or *Vol 3, Pt 2, Ch 2, 2.3 Grey water and sewage – GW character 2.3.4*, as applicable. The **GW** character will also be assigned where grey water is retained on board in dedicated holding tank(s) for discharge ashore, subject to the requirements specified in *Vol 3, Pt 2, Ch 2, 2.3 Grey water and sewage – GW character 2.3.5* to *Vol 3, Pt 2, Ch 2, 2.3 Grey water and sewage – GW character 2.3.9* being met.

2.5 Emissions of nitrogen oxides – NOx-1, NOx-2, NOx-3 characters

2.5.1 ~~For assignment of the **NOx-1** or **NOx-2** character, the total weighted value of NO_x emissions from all installed engines defined within *Vol 3, Pt 2, Ch 2, 2.2 Ballast Water Treatment – BWT character 2.2.1* is not to exceed 80 per cent of the total weighted NO_x emission limits specified in *Regulation 13 – Nitrogen Oxides (NO_x)*.~~ For assignment of the NOx-1 or NOx-2 character, the total weighted value of NO_x emissions from all installed diesel engines with an individual output power greater than 130 kW, other than those used solely for emergency purposes on the ship on which the engine is installed, is not to exceed 80 per cent of the total weighted NO_x emission limits specified in *MARPOL Annex VI, Regulation 13*.

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